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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,568	11/01/2006	Ralph Edmund Harris	117-604	6594

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EXAMINER	
DITRANI, ANGELA M	
ART UNIT	PAPER NUMBER
3676	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,568	HARRIS ET AL.	
	Examiner	Art Unit	
	ANGELA M. DITRANI	3676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 July 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *41-67 and 76-78* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *41-67 and 76-78* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 41-58, 60-67, 76, and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harris et al. (WO 00/57022 – cited in previous action) in view of Still (US 7,166,560 – cited in previous action).

With respect to independent claim 41, Harris et al. discloses a process for disrupting filter cake in an underground formation (p. 2, l. 15-28), which process comprises: dispersing in a treatment fluid an ester capable of being converted by hydrolysis into one or more organic acids (p. 3, l. 15-28; p. 5, l. 29 - p. 6, l. 26); introducing the treatment fluid into said underground formation containing said filter cake; and allowing the ester to hydrolyze in the presence of water to produce organic acid such that acid soluble material within the filter cake or adjacent formation is dissolved (p. 3, l. 5-10).

Harris et al. teaches the formation of the treatment fluid by dispersing the above cited ester capable of producing an organic acid with a polymer breaker (p. 3, l. 5-10). The reference, however, fails to explicitly teach wherein the ester capable of being converted by hydrolysis into one or more organic acids is a solid polymer as claimed.

Still et al. teaches the dispersion of solid polymers capable of producing an organic acid under down hole conditions within a treatment fluid for the purpose of providing a material capable of hydrolyzing as a part of a suspension in a treatment fluid in the well bore, in perforations, in a fracture, or in the pores of the formation itself (col. 6, l. 61-67) in a controlled

manner (col. 2, l. 26-27). Within the background, Still et al. teaches wherein previously known and employed methods within the art used to delay formation of acid down hole include the use of liquid esters which are known to hydrolyze in situ. Still et al., however, further notes that the use of esters as acid precursors leads to the formation of the acids very rapidly as soon as the ester contacts water (col. 2, l. 16-25), thereby forming a need for a delayed, controlled release of acids in situ (col. 2, l. 26-27).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute a solid polymer, i.e., a solid acid-precursor, as taught by Still et al. for the liquid ester acid precursor disclosed by Harris et al. in order to improve upon the acid generation technique disclosed by Harris et al. by providing for acid generation down hole in a controlled manner.

With respect to depending claims 42-46, Still et al. teaches wherein the solid polymer is a polyester, wherein the solid polymer is an aliphatic polyester, wherein the polymer is a polymer which comprises one or more compounds selected from the group as claimed, wherein the hydrolysis of the solid polymer produces lactic or glycolic acid, and wherein the solid polymer is polylactic acid or polyglycolic acid as claimed (col. 3, l. 19-37).

With respect to depending claims 47-49 and 76, Still et al. teaches wherein one or more other substances selected from the group consisting of materials, chemicals, catalysts, and enzymes are incorporated into the solid polymer by encapsulation to allow their controlled release coincident with or after acid production; wherein one or more other substances selected from the group consisting of materials, chemicals, catalysts, and enzymes are incorporated into the solid polymer by dissolution or dispersion to allow their controlled release coincident with

acid production, and, further, wherein the said one or more other materials, chemicals, catalysts, and enzymes released from the solid polymer have functional activity for filter cake treatment or as production chemicals (col. 5, l. 53- col. 7, l. 7).

With respect to depending claims 50, Still et al. teaches wherein the solid polymer is used in a form selected from the group as claimed (col. 6, l. 9-33).

With respect to depending claim 51, Harris et al. discloses incorporating a buffer into the treatment fluid (p. 5, l. 7-27).

With respect to depending claims 52-58, Harris et al. discloses incorporating one or more polymer breakers into the treatment fluid (p. 3, l. 30 –p. 5, l. 27; p. 7, l. 25 – p. 11, l. 2), and, further wherein the polymer breaker is a hydrolase enzyme (p. 9, l. 5-10), a polysaccharide hydrolyzing enzyme (p. 8, l. 12-19), a polymer breaker which can hydrolyze starch, xanthan, cellulose, guar, scleroglucan or succinoglycan or a derivative of any one of the polymers (p. 8, l. 17-19), an oxidant, wherein the oxidant is selected from the group as claimed (p. 7, l. 28 – p. 8, l. 5; p. 8, l. 21 – p. 9, l. 3), and wherein the polymer breaker is in the form of a delayed release preparation (p. 13, l. 16-17).

With respect to depending claim 60, Harris et al. discloses wherein the treatment fluid disrupts or degrades at least a portion of the filter cake and increases the permeability of the formation (p. 2, l. 15-28; p 14. l. 13-25).

With respect to depending claim 61, Harris et al. in view of the solid polymer as taught by Still et al., teaches wherein at least a portion of the polymer remains in the underground formation and continuously releases organic acid and a production chemical during hydrocarbon

production or water injection until the polymer has completely hydrolyzed (col. 6, l. 28 - p. 7, l. 2; p. 14, l. 27-30).

With respect to depending claim 62, Harris et al. discloses wherein at least a portion of the polymer remains in the underground formation wherein the underground formation contains a hydrocarbon or water and wherein the process further comprises recovering hydrocarbon or water from the treated formation (p. 3, l. 12-13; p. 14, l. 29-30).

With respect to depending claim 63, Harris et al. discloses wherein the treatment fluid is introduced into the formation via a well bore which extends to the formation (p. 2, l. 15-27; p. 14, l. 4-30).

With respect to depending claims 64 and 65, Harris et al. discloses the method as provided above with respect to independent claim 41, and, further, wherein the treatment fluid is capable of breaking polymers such as xanthan, cellulose, and guar (p. 8, l. 17-19). The reference, however, fails to explicitly disclose wherein the treatment fluid comprises an acid sensitive viscosifying agent, wherein the viscosifying agent is crosslinked guar gum, and wherein the viscosity of the fluid is reduced by the acid generated by hydrolysis of the solid polymer as claimed. The Examiner hereby takes Official Notice in that it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide for a viscosifying agent, such as crosslinked guar gum, within the treatment fluid of Harris et al. in order to viscosify the fluid within those environments in which an increased viscosity is required to deliver the treatment fluid to the formation, insofar as because the use of crosslinked guar gum to viscosify fluids is well known within the art. Since Harris et al. discloses the capability of the

treatment fluid to break polymers including guar, the viscosity of the crosslinked guar gum is capable of being reduced by the acid generated upon hydrolysis of the solid polymer as claimed.

With respect to depending claim 66, Harris et al. discloses wherein the treatment fluid further comprises calcium peroxide wherein the organic acid produced by hydrolysis, of the solid polymer in view of Still et al., leads to the generation of hydrogen peroxide (p. 5, l. 4-5).

With respect to depending claim 67, Still et al. teaches wherein the treatment fluid further comprises ammonium bifluoride and wherein the organic acid produced by hydrolysis of the solid polymer leads to the generation of hydrogen fluoride (col. 5, l. 15-51).

With respect to depending claim 77, Still et al. teaches wherein the polymer is a polymer which comprises one or more compounds selected from the group as claimed (col. 3, l. 19-37).

3. Claims 59 and 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harris et al. in view of Still et al. as applied to claim 41 above, and further in view of Harris et al. (WO 01/02698 – cited in previous action, '698 herein).

Harris et al. in view of Still et al. teaches the method as provided above with respect to independent claim 41 wherein Harris et al. further teaches wherein the treatment fluid comprises one or more polymer breakers and Harris et al. in view of Still et al. teaches wherein the fluid comprises one or more solid polymers. The combination, however, is silent to wherein the treatment fluid is a gravel packing fluid as claimed within depending claims 59 and 78. '698 teaches a method of treating a subterranean formation wherein the treatment fluid may comprise an ester dispersed in water that hydrolyzes to produce an organic acid to dissolve acid soluble material present within the reservoir wherein the fluid may be incorporated within a gravel packing fluid for the purpose of treatment of filter cakes following gravel packing operations by

incorporation of suitable components into the gravel packing fluid (p. 3, l. 4-7). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the treatment fluid of Harris et al., in view of the solid polymer teaching of Still et al., as a gravel packing fluid in order to treat a filter cake following a gravel packing operation, thereby enhancing subsequent production from the gravel packed well.

Response to Arguments

4. Applicant's arguments filed 07/02/10 with respect to the 35 USC 103(a) rejections of claims 41-58, 60-67, 76 and 77 have been fully considered but they are not persuasive.

Applicant asserts that Harris et al. and Still et al. relate to fundamentally different techniques and so they are not compatible teachings; Applicant presents that Harris et al. aims to provide simple and effective methods for removal of filter cakes over long horizontal intervals, while Still et al. is concerned not with removal of filter cakes, but with acid fracturing methods. Applicant notes that filter cake disruption methods and acid fracturing methods are fundamentally different techniques and that one of ordinary skill would not contemplate combining Harris et al. with Still et al. because entirely different criteria apply when designing fluids suitable for use in filter cake disruption and acid fracturing.

The Examiner disagrees with Applicant's assertion that Harris et al. and Still et al. relate to fundamentally different techniques. Although the Examiner agrees with Applicant that Harris et al. discloses methods for filter cake removal over long horizontal intervals on page 2, lines 22-23, the Examiner would like to note that in the subsequent paragraph on page 2, beginning at line 25, Harris et al. discloses "Another object of the present invention is to provide single stage treatment methods which can remove damage and provide further stimulation of production or

injection rate by increasing the matrix permeability of adjacent undamaged regions of the formation. Harris et al. further discloses on page 3, lines 20-23, wherein the disclosed treatment fluid can be used to assist in the dissolution of carbonate present in a filter cake, the dissolution of carbonate rock adjacent to a filter cake or the dissolution of carbonate rock adjacent to a biofilm. The Examiner would also like to note that as cited within the rejection above, beginning at column 6, line 61, Still et al. teaches that the solid acid-precursor particles self-destruct in-situ at the location where they are placed, which may be a part of a suspension in a treatment fluid in the well bore, in perforations, in a fracture, as a component of a filter cake on the walls of a wellbore or of a fracture, or in the pores of the formation itself. The method is further taught as being used in carbonates, and that, although the particles are intended to be in a fracture, they may end up in other places where they may then self-destruct. Since both Harris et al. and Still et al. teach wherein the material capable of being converted by hydrolysis into one or more organic acids can be used to generate acid at the location at which the material is placed, wherein both teach that the location may be a filter cake or carbonate rock, for dissolution of the filter cake and surrounding carbonate, the techniques of Harris et al. and Still et al. are not fundamentally different as Applicant asserts.

Applicant further asserts that the disclosure of solid polymers in Still et al. would not motivate one of ordinary skill in the art to use solid polymers for disrupting filter cake.
The Examiner disagrees. As provided within the rejection of independent claim 41, above, Still et al. teaches the dispersion of solid polymers capable of producing an organic acid under down hole conditions within a treatment fluid for the purpose of providing a material capable of

hydrolyzing as a part of a suspension in a treatment fluid in the well bore, in perforations, in a fracture, or in the pores of the formation itself (col. 6, l. 61-67) in a controlled manner (col. 2, l. 26-27). Still et al. further teaches within the background that the use of previously known and employed methods to delay the formation of acid down hole using liquid esters, i.e., the hydrolysable material disclosed by Harris et al., leads to the formation of the acids very rapidly (col. 2, l. 16-25), while the solid acid-precursor disclosed by Still et al. allows for a controlled release of acids in situ (col. 2, l. 26-27) at the location where it is placed. Since Harris et al. teaches wherein the liquid esters used to be converted to organic acids may be placed so as to provide for the dissolution of carbonate present in a filter cake, the dissolution of carbonate rock adjacent to a filter cake or the dissolution of carbonate rock adjacent to a biofilm, and the solid acid-precursors of Still et al. may be placed as a part of a suspension in a treatment fluid in the well bore, in perforations, in a fracture, as a component of a filter cake on the walls of a wellbore or of a fracture, or in the pores of the formation itself so as to generate an organic acid therein, wherein the solid acid-cursors of Still et al. provide for the release of acids in a controlled manner as compared to liquid esters, the Examiner maintains that Still et al.'s disclosure of solid polymers motivates one of ordinary skill in the art to use solid polymers for disruption of filter cake.

Applicant further asserts that Still et al. teaches away from making the combination of features that would be needed to arrive at the invention while citing a portion of the reference taken from the background. Applicant states that the fluids described in Still et al. are specifically intended to hydrolyze slow enough that they do not react with filter cake in the

formation and that Still et al.'s disclosure referred to by the Examiner taken from column 6, lines 61-67 that the location where the solid polymer hydrolyzes may be "deliberate" or "inadvertent" does not constitute a teaching that the solid polymer should, or can, be used for disrupting filter cakes because the "great majority" of the material ends up in the fracture, where it generates acid and etches the fracture faces.

The Examiner respectfully disagrees. Although a "great majority" may end up in the fracture so as to generate acid and etch the fracture face, the remaining portion of the solid polymer material is capable of hydrolyzing to produce an organic acid at the location where it is placed; therefore, when the location is a place that constitutes a component of the filter cake on the walls of the well bore, and the solid polymer hydrolyzes, the filter cake in the formation is disrupted.

Therefore, the rejection of independent claim 41 is maintained. Since Applicant has presented no further arguments with respect to the rejections of claims 42-58, 60-67, 76, and 77, which depend upon independent claim 41, the rejection of claims 41-58, 60-67, 76 and 77 as unpatentable over Harris et al. in view of Still et al. is maintained.

5. Applicant's arguments filed 07/02/10 with respect to the 35 USC 103(a) rejections of claims 59 and 78 as being unpatentable over Harris et al. in view of Still et al. as applied to claim 41, and further in view of '698 have been fully considered but they are not persuasive.

Applicant asserts that the discussion addressed above establishes that the claimed subject matter is non-obvious over Harris et al. in view of Still et al., and, further notes that '698 does

not remedy the deficiencies in the teaching of Harris et al. in view of Still et al. Applicant asserts that '698 relates to a method for treating an underground reservoir to disrupt filter cake by introducing a treatment liquid comprising a liquid ester and a non-enzyme catalyst, and, therefore, the fundamental deficiency in Harris et al. is shared by '698. Applicant states that one of ordinary skill would not have arrived at the subject matter of claim 41 by way of an obvious combination of Harris et al., *Constien*, and '698.

The Examiner would like to note that *Constien* was not applied in a rejection in the previous action. Furthermore, should Applicant have intended to note that the combination of Harris et al., *Still et al.*, and '698 would not provide for the subject matter of claim 41, the Examiner maintains that claim 41 is unpatentable over Harris et al. in view of Still et al. as provided above. Since Applicant has presented no further arguments with respect to the individual limitations of claims 59 and 78 rejected in further combination with '698, the rejections thereof are maintained.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANGELA M. DITRANI whose telephone number is (571)272-2182. The examiner can normally be reached on M-F, 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shane Bomar can be reached on (571)272-7026. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer H Gay/
Primary Examiner, Art Unit 3676

AD
07/30/10